**Predicting the Crystallinity of MW-Vacuum Crystallized Sucrose by Time Doman NMR**

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Sucrose production consists of many different unit operations and one of the most critical unit operation in the sucrose production is crystallization; which is a separation of sugar molecules from beet syrup. Sucrose crystallization is performed mostly by evaporation under vacuum in refined sugar industry. This operation is a considerably time-consuming step-in sucrose production, which limits production and it has a strong effect on product quality. Since microwave is a novel processing method that is infamous for providing drastic decrease in process times, it is hypothesized that combining this technology with a vacuum system might be a way to shorten crystallization of sucrose. In this study, sucrose was crystallized from the mother liquor of beet processing using microwave vacuum. The microwave power levels and the absolute pressure that are used for the crystallization were determined as 20,30 and 40% power and 260 mmHg pressure respectively, by preliminary studies. A non-destructive, TD-NMR has recently been shown to predict the crystallinity of sucrose samples. Solid echo sequence has been used and crystallinity of the sugars were calculated. The study showed that TD-NMR could be used to assess the quality of sucrose samples obtained through microwave vacuum technique.

**Keywords:** Sucrose, crystallisation, TD-NMR, MW vacuum

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